Middle East Agricultural Health Study

An agreement to study the human health effects of pesticides in the Middle East was enthusiastically adopted by foreign ministers and other officials from several Middle East countries, the West Bank, Gaza Strip, the European Community, Canada, and the United States. The Middle East Agricultural Health Study, conceived by the NIEHS and the Fogarty International Center at the National Institutes of Health, was approved at a meeting in Manama, Bahrain, in October 1994. The next step took place in December, when technical experts from the Middle East and North America met at a workshop in Cairo to iron out the details of the NIH initiative.

The Agricultural Health Study is part of the broader Middle East Peace Initiative. While the meeting of foreign ministers in Bahrain set the NIH proposal in motion, the regional workshop in Egypt addressed logistical issues related to gathering data, current collaborations on pesticide use, and implementing the study.

Scientific experts from academic institutions and government agencies from the Middle East region expressed concern and frustration that dramatic environmental impacts of population changes and agricultural, technological, and industrial advances in the region have not been adequately studied and are often unrecognized by government officials and the general public. Participants proposed collaborative research, communication, and education strategies to address these environmental concerns. Studies on the health effects of agricultural chemicals were identified as a top priority.

Agricultural chemicals are usually mixtures of chemicals, some of which can damage the environment and accumulate in ecosystems, including ground- and surface water, and contaminate the food supply. Many agricultural chemicals can cause a range of adverse human health effects. Children may be particularly vulnerable. The NIH proposal attempts to better define the extent of adverse health effects in the Middle East region, promote the safe use of pesticides, and ensure the applications of the most effective pesticide-management guidelines.

In densely populated areas, large quantities of pesticides are used annually. In addition to pesticides, fertilizers, growth regulators, food additives, synthetic dyes, detergents, and dusts are sources of pollution in the environment. There is an urgent need to address acute and long-term health effects caused by agricultural chemicals by initiating collaborative research programs among Middle East and U.S. scientists. Data must be generated on human exposures, nature and extent of health effects, and mechanisms of toxic action.

One of the major components of the NIH proposal is a research program to assess the non-cancer consequences of agricultural chemical exposures in Mid-Eastern populations. Potential collaborators for these health effects studies have been identified in Egypt, Israel, Jordan, the West Bank and the Gaza Strip, and the United States. Scientists from other nations in the region will also be invited to participate.

The experimental plan will address neurological deficits, childhood development, birth defects, and hypertension as health endpoints. Specific measurements will assess nerve conduction velocity, acetylcholinesterase inhibition, balance, visual assessments, speech impairment, hearing, blood pressure, birth weight and gross birth defects.

Another exciting component of the NIH proposal is the Peace Fellowships training program designed to bring junior-level scientists from each participating country to the United States to gain experience in research methods that will be used in their home countries. The training initiative would expand a cadre of young research scientists dedicated to environmental and occupational health in established mentorships and enhance the working relationship among scientists in the United States and the Middle East.

The proposed collaborative studies among scientists within the region will allow new intervention and prevention approaches to better manage the risks of agricultural chemical use. Furthermore, communication and health education strategies involving the NIH proposal will assist national policymakers and local authorities in devising mitigation plans on the use of agricultural chemicals.

Components of the Middle East Agricultural Health Study

- Communications, Information, and Health Education Strategies
- Assessment of Available Data
- Training Peace Fellowships
- Human Health Effects Research
- Experimental Approaches

Environmental Justice: Partnerships for Communication

Prominent among the goals of the NIEHS is support of research aimed at achieving environmental justice for all populations. Assays of the health effects of environmental pollution, as well as regulations based on such assays, are often performed with little or no input from affected communities. The purpose of the communication program is to institute mechanisms to bridge this communication gap so that the communities involved have a role in identifying and defining problems and risks related to environmental health and in shaping future research approaches to such problems.

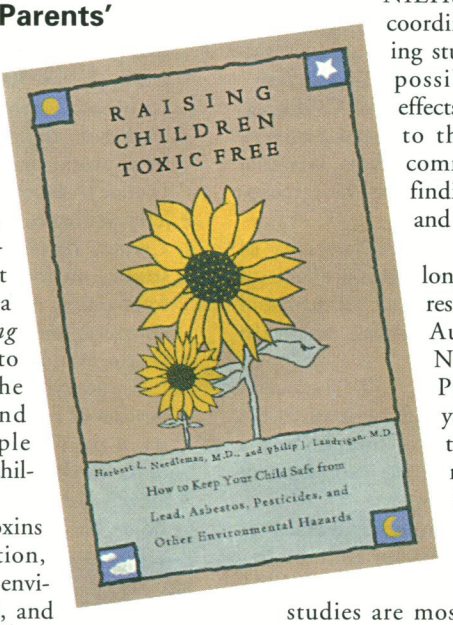
A Request for Applications was initially issued in January 1994. Applications were evaluated by a Special Review Committee composed of environmental health researchers, health care providers, and community representatives. Three awards, two of which address Native American issues, were made in September 1994.

Environmental investigators at Clark University, in collaboration with Native Americans for a Clean Environment and Citizen Alert Native American Program, are seeking to increase the awareness of Native American communities exposed to radiation contamination. These communities bear a disproportionate burden of risk from nuclear activities, ranging from uranium mining to waste disposal. Members of the affected communities are ill prepared to understand and deal with the hazards of radiation contamination. The grantee will design and implement a plan for risk management and prevention activities at the Western Shoshone Nation near the Nevada Test Site and at the Cherokee Nation at Sequoyah Fuels, Oklahoma, a uranium processing facility in operation for 23 years. Education modules of two types will be implemented: community modules, created exclusively by Native American collaborators; and health education modules, created by scientists and health care provider trainers. Each of these components involves the community in learning about health risks and in sharing their perspectives of this risk with scientists and health professionals. Relevant materials and strategies will be shared with other Native American communities.

The State University of New York, Albany, in collaboration with St. Regis Mohawk Health Services, intends to design community-based strategies for environmental health education, outreach, and training in the Akwesasne Mohawk community, which is adjacent to a Superfund site in the Great Lakes Basin–St. Lawrence River watershed. Environmental hazards have resulted from the rapid transition from an agricultural to an industrial environment. Industry appears to have produced high levels of polychlorinated biphenyls (PCBs) from manufacture of hydraulic fluids until 1973. Sludge containing PCBs was placed in disposal pits adjacent to the Akwesasne community and has been found in water and soil in the area. Sediments have been found in the St. Lawrence River, which serves as a major source of fish, a protein staple in the Mohawk diet. Contaminants have been found in human breast milk, and a number of symptom-related health effects have been experienced by residents. Chronic fluoride poisoning has been observed in cattle, resulting from smokestacks emissions of a metal smelter. Lethal levels of organochlorines have been found in tissues of some animals in the immediate environment. This project is led and directed by members of the target community. It is implemented, evaluated, and disseminated explicitly through community members. The project team has worked together extensively and has nine years of experience in communicating information on health risks to the community.

A third grant funded under this initiative was awarded to a community organization, Citizens for a Better Environment. This group, in collaboration with the Labor Occupational Safety and Health Program and the Center for Occupational and Environmental Health at UCLA and the Community Health Foundation, aims to educate community members and health care providers, promote adoption of pollution prevention measures, and establish a community-based strategy for reducing community and worker exposure to environmental pollutants in southeast Los Angeles, a highly industrialized area home to a low-income population, approximately 90% Hispanic/Latino. Pollution sources include large, highly industrialized tracts where chemicals are routinely or accidentally released, severe urban smog, occupational exposures, and lead exposures. The zip code area which includes southeast Los Angeles was identified as the dirtiest subregion within the state of California by the EPA. About 70 manufacturing firms in South East Los Angeles reported releases of 1.4 million pounds of toxic chemicals into the air in 1992. A major objective of this project is analysis of data to affirm the list of environmental pollutants already known and to determine whether gaps exist in the data. Environmental health issues of priority to the community will be determined and addressed. CBE has already received invitations from mayors and council members to help reduce community toxics exposure. CBE helped to develop LA CAUSE (Los Angeles Communities Assembled and United for a Sustainable Environment), a community education project that seeks to promote environmentally friendly jobs. LA CAUSE will involve and educate community members and has a history of reaching residents and workers from the region. Sources of health hazards will be identified, and strategies will be developed to attempt exposure reduction.

Book Addresses Parents' Concerns about Toxins



"Everything causes cancer," according to the old cliche. Now parents, pediatricians, social workers, and others concerned about children's health have a concise guide, *Raising Children Toxic Free,* to help them identify the real toxic hazards and adopt practical, simple precautions to protect children and themselves.

The book covers toxins that impact reproduction, behavior, development, environmental neurotoxins, and cancer. Agents discussed specifically include lead, mercury, asbestos, pesticides, radiation, tobacco, solvents and PCBs, and air pollution. The book was written by Herbert L. Needleman, professor of psychiatry and pediatrics at the University of Pittsburgh School of Medicine, and Philip J. Landrigan, professor of pediatrics and chair of community medicine and director of the NIEHS Environmental Health Sciences Center at Mount Sinai School of Medicine in New York City. The publisher is Farrar, Straus and Giroux, New York.

While some of the remedies suggested require community and political action (asbestos in the schools), other remedial action is quite direct. For example, parents can air clothes just back from the drycleaners outdoors to reduce exposure to perchloroethylene fumes in the home. Avoiding fruits and vegetables imported from outside the United States, where pesticides may not be properly used, is another simple step.

NIEHS Awards Grants for EMF Research

NIEHS and the Department of Energy are coordinating the implementation of the 1992 Energy Policy Act (Section 2118 of Public Law 102-486), which was signed in October 1992. This is a five-year federally coordinated effort to evaluate developing technologies and research related to the effects on biological systems of exposure to electric and magnetic fields produced by the generation, transmission, and use of electric energy.

The Department of Energy is responsible for developing technologies to characterize and mitigate these fields, while NIEHS is responsible for coordinating and conducting studies to evaluate the possible adverse health effects related to exposures to these fields and for communicating of these findings to policymakers and the public.

The NIEHS has a long history of funding research in this area. In August 1994, the National Toxicology Program began two-year rodent studies of the effects of magnetic fields. Magnetic fields, rather than electric, are being evaluated because epidemiological studies are most consistent for an association of cancer with magnetic fields. New grants administered through the NIEHS Division of Extramural Research and Training, funded by the Energy Policy Act of 1992 (Section 2118 of Public Law 102-486) have further broadened NIEHS research on electromagnetic fields. Newly awarded grants funded by the Energy Policy act are:

- Dean Astumian, University of Chicago: Interactions between low-frequency AC electric fields and yeast membrane proteins;
- Elizabeth Balcer-Kubiczek, University of Maryland, Baltimore: Effects of 60 Hz EMFs on the expression of genes associated with cancer in human cell lines, HL-60 and MCF-7;
- David Binninger, Florida Atlantic University, Boca Raton: Molecular basis for the effects of 60 Hz EMFs on gene expression (transcription) in yeast;
- Craig Byus, University of California,